

# Adrift in the California Current: Passive acoustic monitoring for ecosystem studies

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"Sound Bytes"  
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2. NOAA Southwest Fisheries Science Center
3. Cordell Bank and Greater Farallones National Marine Sanctuaries



**NOAA  
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Beyond the Golden Gate Research Symposium || 19-20 January 2022

**NATIONAL MARINE  
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# Coming Soon to California: Offshore Wind Farms



How can we monitor, manage, and mitigate the impacts of activities associated with these wind farms?

## **Primary Research Objective:**

Document marine mammal distribution and behavior from underwater acoustic recordings



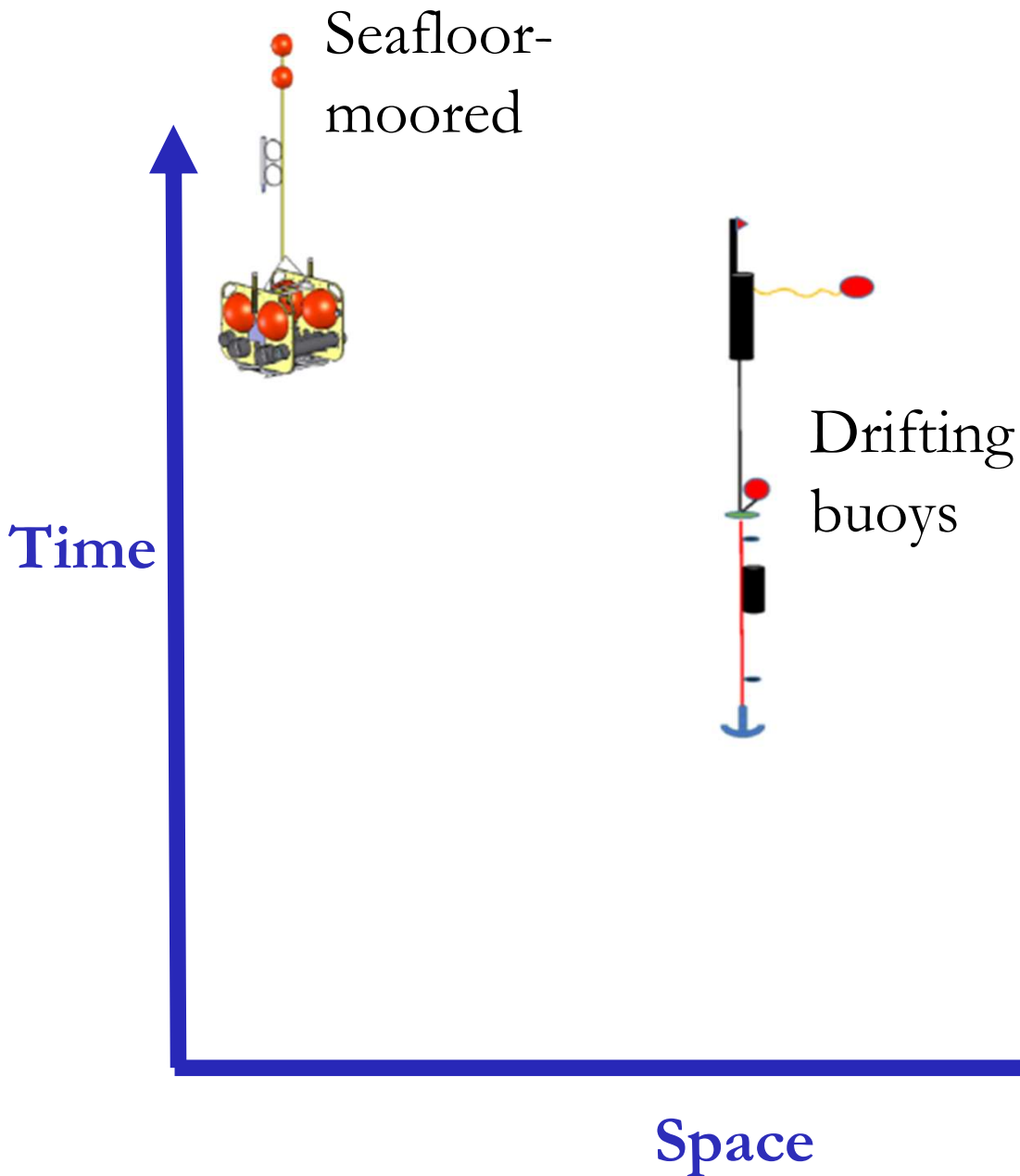
# Acoustic monitoring for cetaceans

## Sound as a primary sense

- Navigate
- Forage
- Communicate
- Avoid threats



# The Importance of Scale



Why we use drifting buoys:

- balance time/spatial coverage
- able to survey pelagic habitats
- affordable
- easy to deploy on vessels of opportunity  
(save more \$\$)

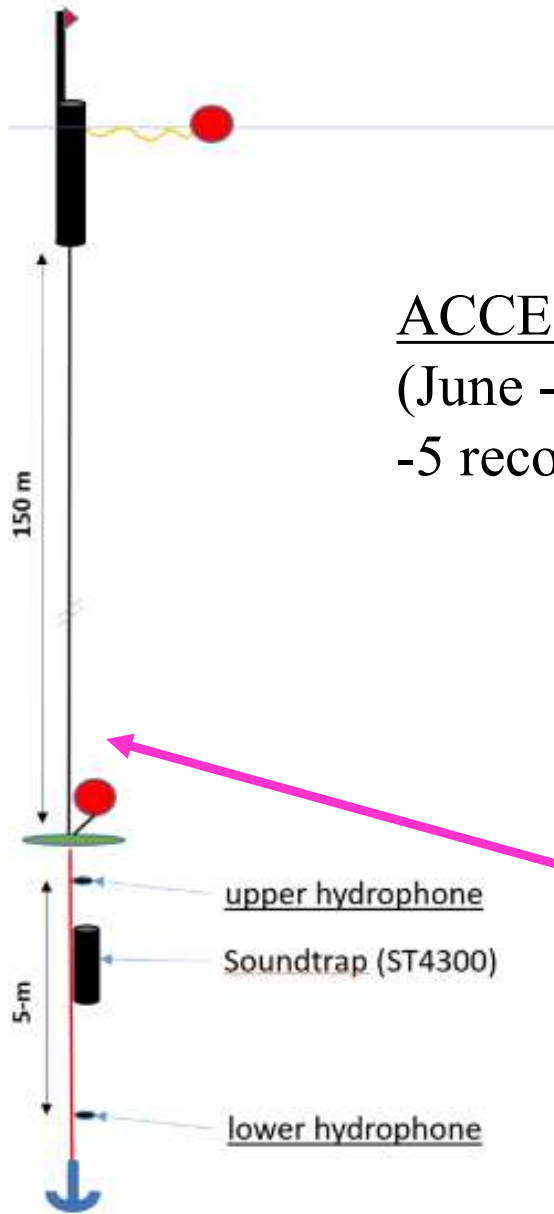
Ship-based surveys



# Methods:

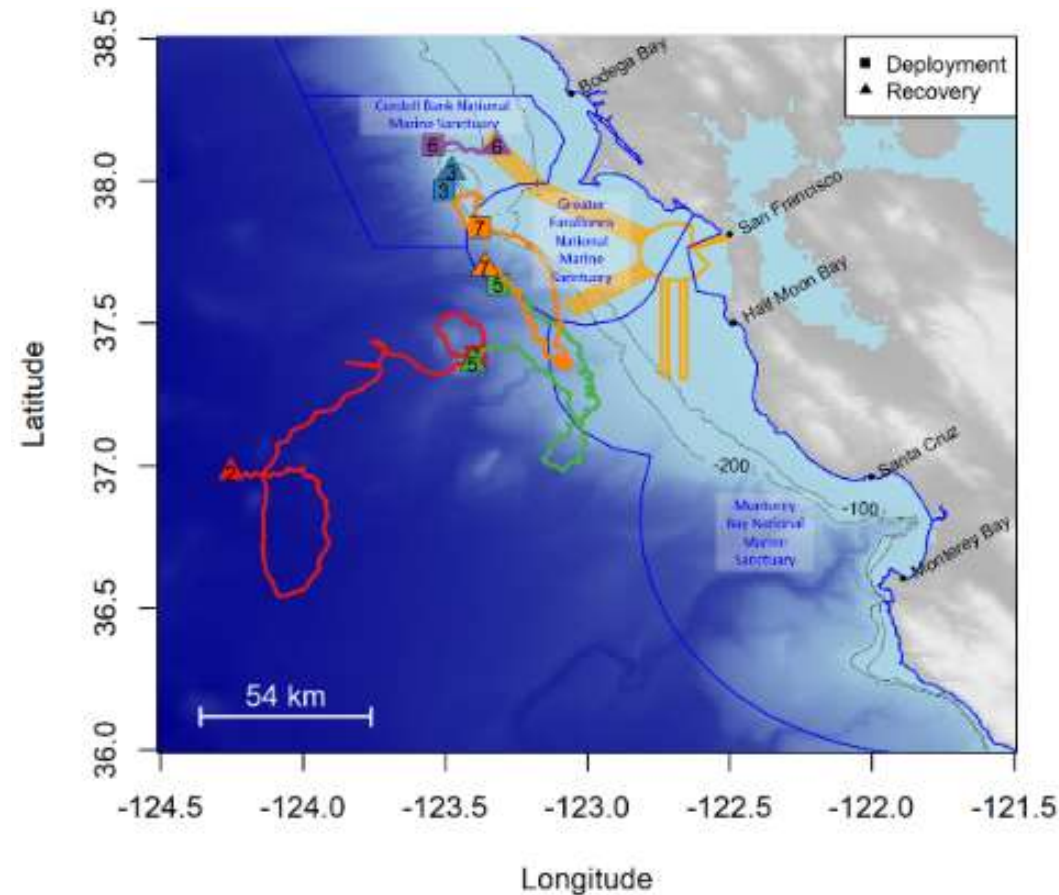
## Passive acoustic data collection

ACCESS Surveys  
(June - Aug 2021)  
-5 recovered buoys



Want to add a sensor to our array?  
Let us know!

Not to Scale



# Methods: Analysis of Echolocation Clicks

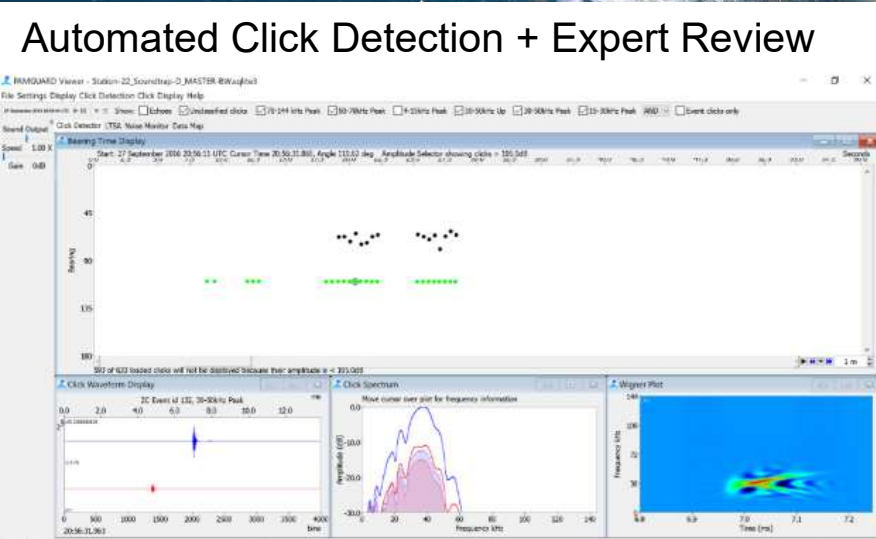
Advancing Science with Open Source Methods

-Pamguard software

<https://www.pamguard.org/>

-PAMpal (R package by Taiki Sakai)

<https://taikisan21.github.io/PAMpal/>



See details in  
Simonis et al 2020

PASSIVE ACOUSTIC SURVEY  
OF DEEP-DIVING  
ODONTOCETES IN THE  
CALIFORNIA CURRENT  
ECOSYSTEM 2018: FINAL  
REPORT

Anne E. Simonis, Jennifer S.  
Trickey, Jay Barlow, Shannon  
Rankin, Jorge Urbán, Lorenzo  
Rojas-Bracho, Jeffrey E. Moore

NOAA-TM-NMFS-SWFSC-630  
June 2020

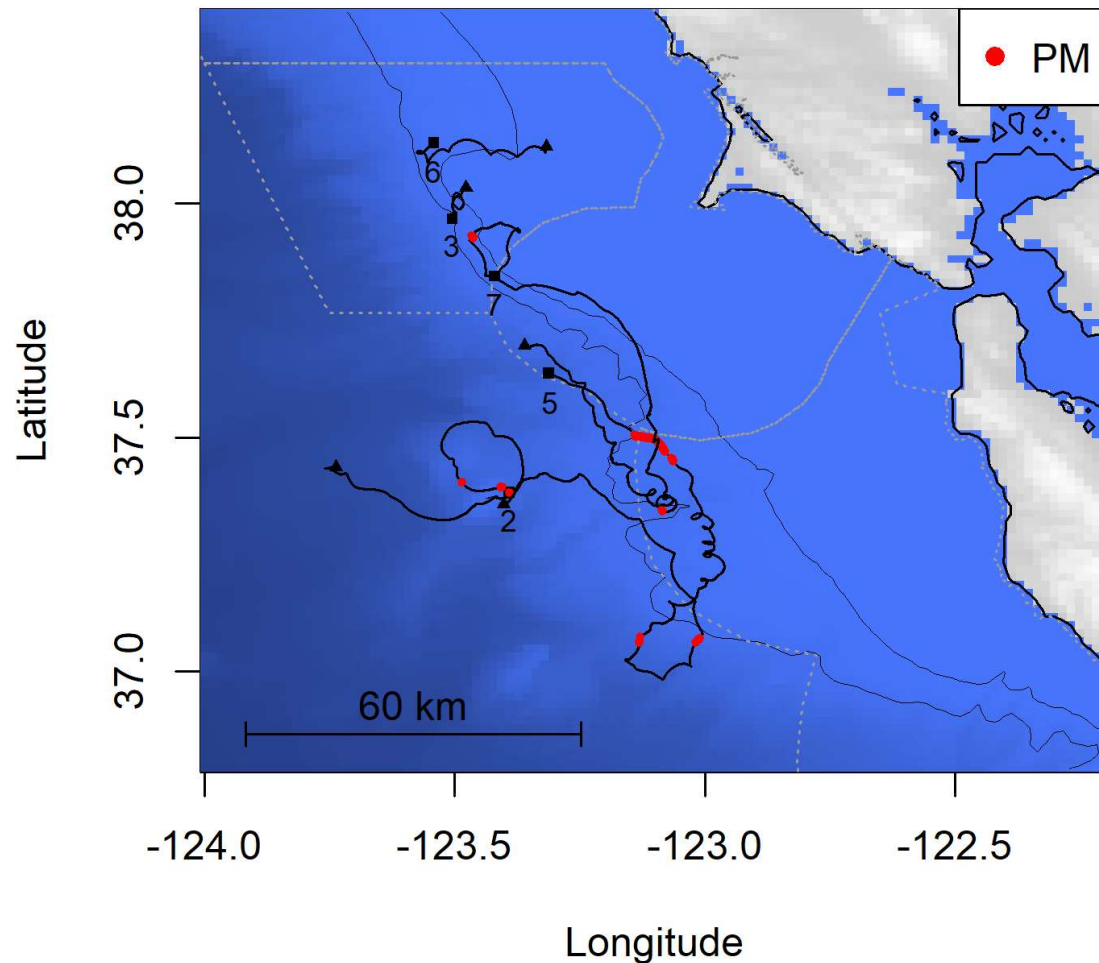
# Heard, but not seen: Sperm Whales

*Physeter macrocephalus*

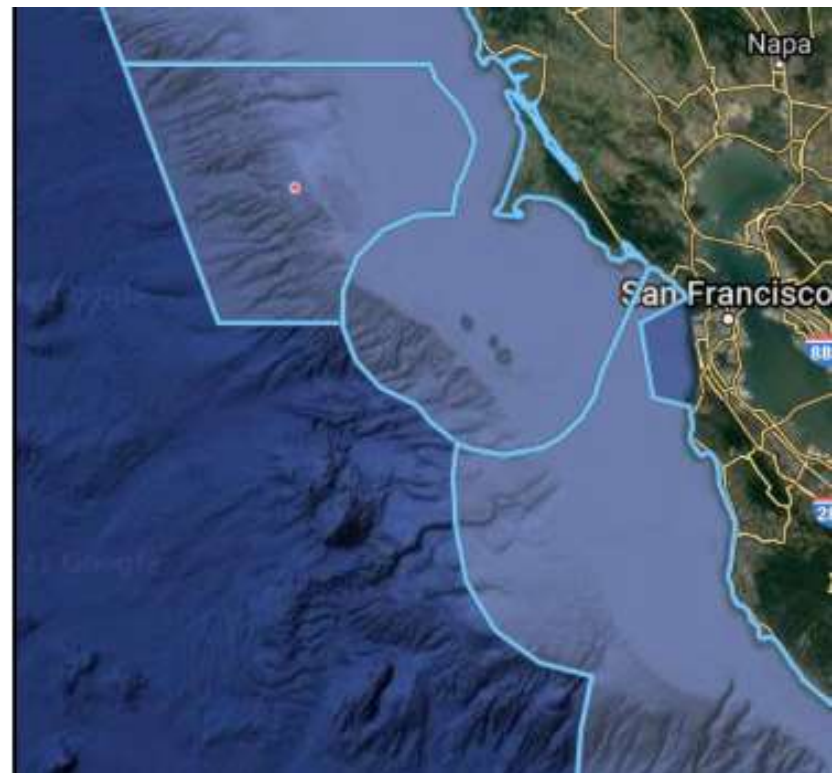


Image: NOAA Fisheries

Acoustic Observations: 2021



Visual Observations: 1987 - 2019



Credit: ACCESS Partnership

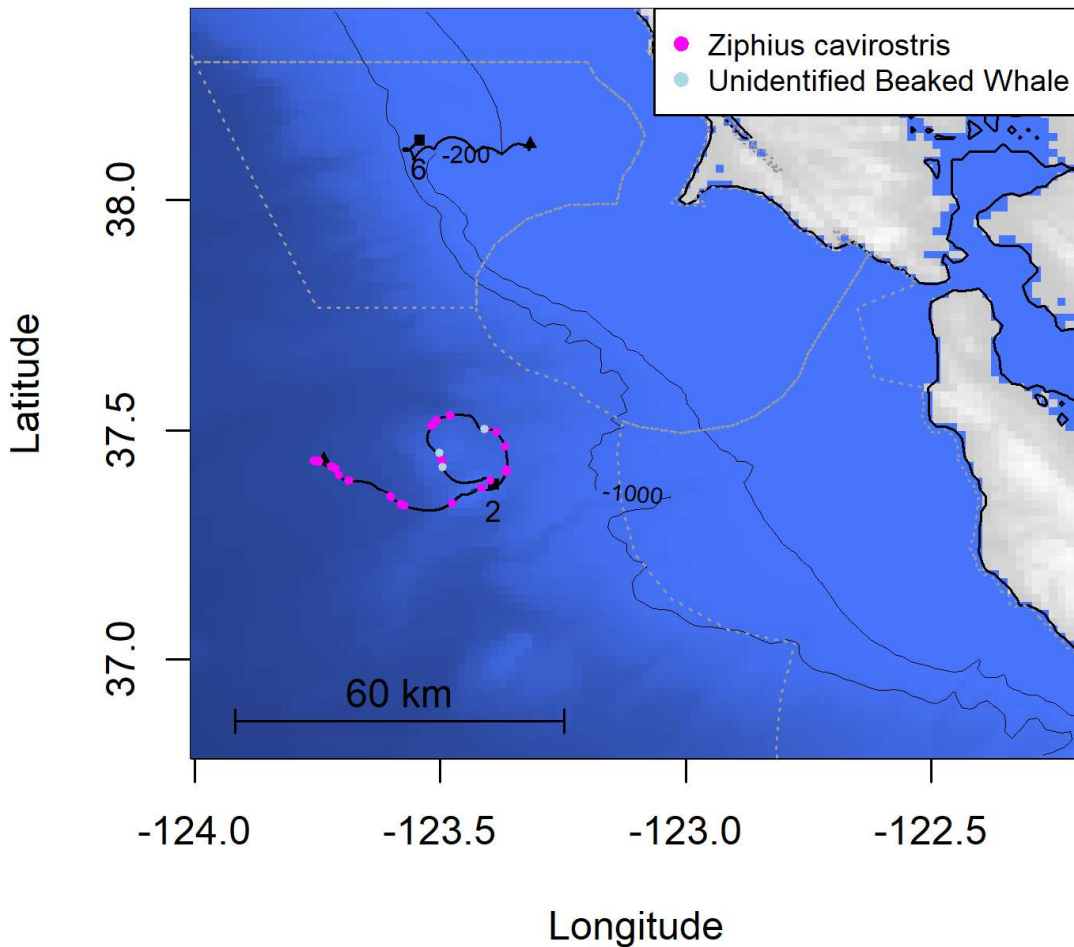


# Heard, but not seen: Beaked Whales

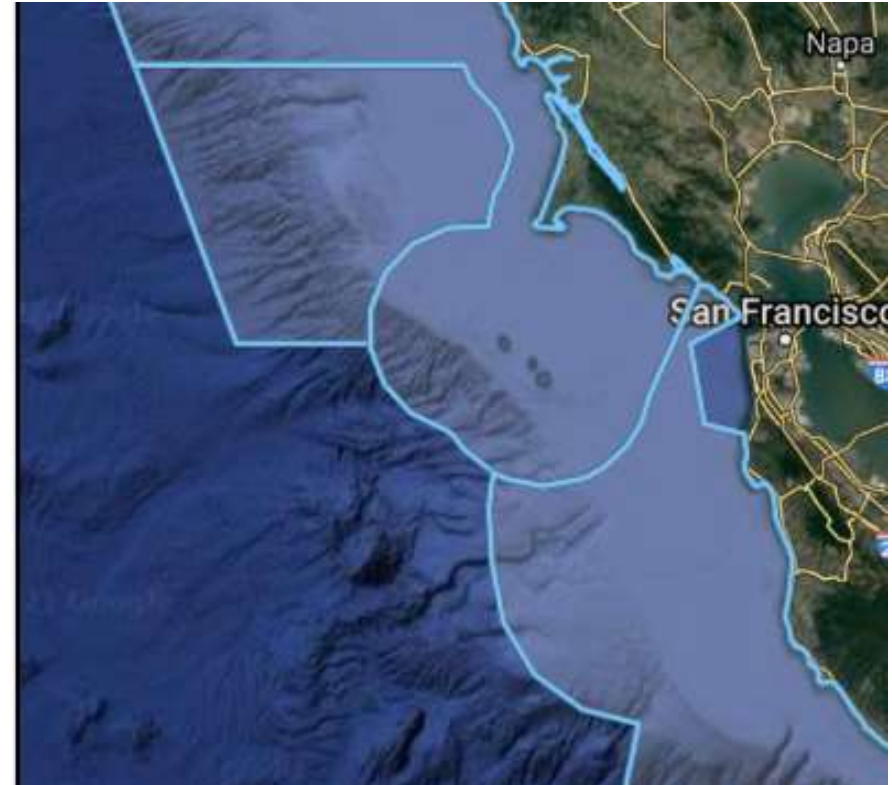


Credit: NOAA Fisheries/A. Simonis

Acoustic Observations: 2021



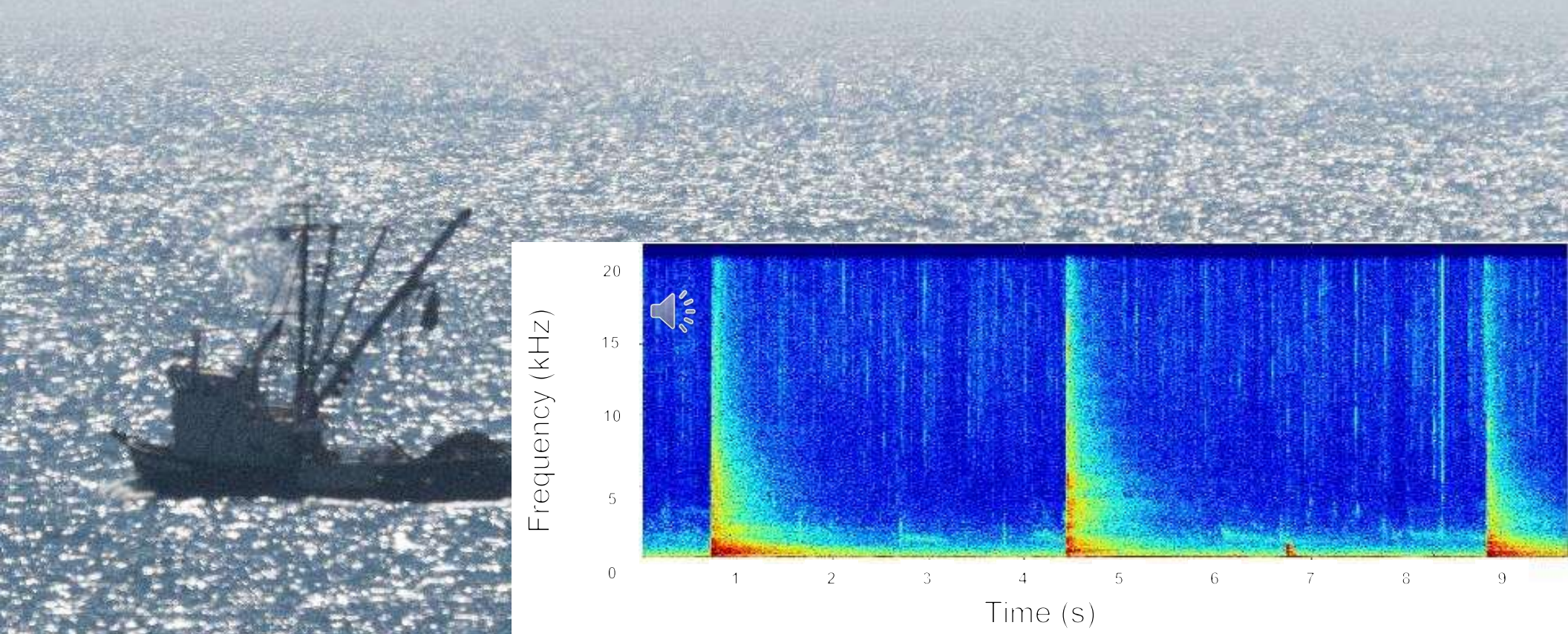
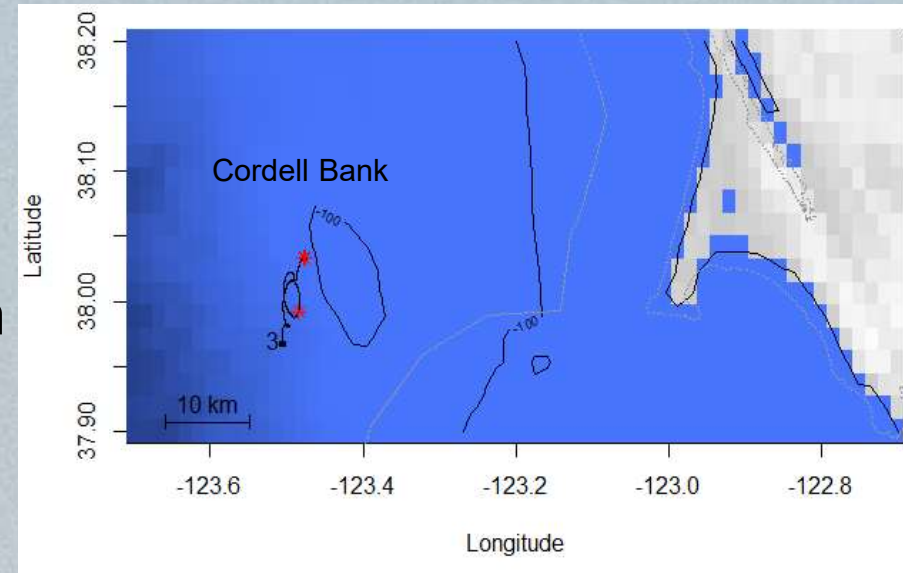
Visual Observations: 1987 - 2019



Credit: ACCESS Partnership

# Explosions

- Buoy at Cordell Bank
- Multiple explosions detected on 4 days in July – August, 2021
- Potential seal bombs (signal suggests explosion occurred underwater)



# Future Activities

Are you doing offshore surveys / whale watching trips?  
We are seeking partners to deploy/recover buoys!  
Please contact me: [anne.simonis@noaa.gov](mailto:anne.simonis@noaa.gov)



Photo: SIO Whale Acoustics Lab

- Baleen whale analysis → Shipping lanes
- More deployments w/2022 ACCESS survey

# Thank you!

## **Funding:**

**Bureau of Ocean Energy Management**  
**NOAA Southwest Fisheries Science Center**  
**NOAA National Marine Sanctuaries**

## **Fieldwork:**

- ACCESS Partnership
- Captain & crew of R/V Fulmar
  - Capt. Rayon Carruthers, Ben Kaiser, & Cale Silva
- Captain & crew of R/V Mussel Point
  - Capt. Steve Neil, David Dann of Bodega Marine Lab
- Captain & crew of R/V Shimada
- Dick Ogg, F/V Karen Jeanne

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